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EXAMINER

KISS, ERIC B

ART UNIT PAPER NUMBER

2122

DATE MAILED: 09/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/693,090

Applicant(s)

TRELEWICZ ET AL.

Examiner

Eric B. Kiss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6 April 2004 ✓
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The reply filed 2 June 2004 has been received and entered. Claims 1-29 are pending.

#### ***Drawings***

2. This application contains informal drawings, which are acceptable for examination purposes only. When the application is allowed, Applicant will be required to submit new formal drawings.

#### ***Response to Amendment***

3. The amendment filed 2 June 2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: In the amendment to the first paragraph of p. 4, Applicant significantly alters the definition of the term "input precision" by replacing the phrase "prior to" with its opposite, "after". No evidence has been presented that this amendment has been made merely to correct any obvious error.

Applicant is required to cancel the new matter in the reply to this Office Action.

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4. The declaration under 37 CFR 1.132 filed 2 June 2004 is insufficient to overcome the rejection of claims 1-29 based upon "the 'SWAR' paper" (referenced by the Examiner as FiD98) as set forth in the last Office action because: Applicant's newly added claim limitations are specified in permissive language (for example, reciting "may", "can", and "permitted to"), and the broadest reasonable interpretation of these limitations is that they are optional components. Accordingly, any arguments that these features provide a patentable distinction over the prior art is unpersuasive.

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### *Specification*

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5. It is noted that Applicant has chosen not to adopt the advisory guidance from the Examiner-cited section of the MPEP regarding the content of the Abstract of the Disclosure, which states that the Abstract of the Disclosure should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art. As Applicant has pointed out (see pp. 9-10 of Applicant's remarks under the heading "Objections to the Abstract"), there is no obligation to comply with these guidelines due to the permissive language in which they are stated. Accordingly, the Examiner is withdrawing the objection to the abstract.

6. It is noted that Applicant has chosen not to adopt the advisory guidance from the Examiner regarding appropriate usage of trademarks, as discussed in MPEP §608.01(v). Specifically, the Examiner suggested:

Trademarks should be capitalized wherever they appear (capitalize each letter of the trademark or, alternatively, accompany the trademark with an appropriate

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designation symbol such as <sup>TM</sup> or ®) and be accompanied by the generic terminology (use trademarks as adjectives, not as nouns; for example, "WINDOWS NT operating system" would be an appropriate use of the WINDOWS NT trademark) [see item number 4 on pp. 2-3 of the Office action mailed 25 March 2004].

Although the Examiner is withdrawing the objection to the specification based upon Applicant's usage of various trademarks (in view of the permissive language of the MPEP), the Examiner encourages Applicant to consider the following documents available through the World Wide Web, which describe appropriate usage of trademarks from various trademark owners:

- a) <http://www.ibm.com/legal/copytrade.shtml> (for the trademarks of IBM)
- b) <http://www.sun.com/policies/trademarks/> (for the trademarks of Sun Microsystems)
- c) <http://www.microsoft.com/mscorp/ip/trademarks/gnlguide.asp> (for the trademarks of Microsoft)
- d) <http://www.unix.org/tmug2.pdf> (for the trademarks of The Open Group, including the trademark UNIX)

7. The disclosure is objected to, based on the content of the final paragraph (see p. 21, line 7, through p. 22, line 2), as discussed below.

The attempt to incorporate subject matter into this application by reference to,

all structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art,

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is improper because it appears to be an attempt to create a “living” document based on nebulous future modifications. It is unclear what specific information Applicant is intending to incorporate.

***Response to Arguments***

8. Applicant’s arguments, see pp. 10-11, filed 2 June 2004, with respect to the rejections of claims 1-29 under 35 U.S.C. §112, first and second paragraphs, have been fully considered and are persuasive. The rejection of claims 1-29 under 35 U.S.C. §112, first and second paragraphs, has been withdrawn. However, a new rejection under 35 U.S.C. §112, first paragraph, is made of record based on the written description requirement as discussed below.

9. In response to Applicant’s seasonable challenge to the statements of Official Notice taken in the previous Office action:

For the rejection of claims 5 and 29, the Examiner submits the following documentation in support of the statement of Official Notice:

Andrew C. Staugaard, Jr., “Structured and Object-Oriented Techniques: an Introduction Using C++,” 1997, Prentice-Hall, Inc., pp. iii, iv, 70, and 75 (see the rejection of claims 5 and 29 below for specific citations within this reference).

For the rejection of claims 7-10, 22, 27, and 28, the Examiner submits that the Applicant-cited reference, U.S. Patent No. 6,080,204 to Mendel (cited in the Information Disclosure Statement filed 20 October 2000, supports the statement of Official Notice (see the rejection of claims 7-10, 22, 27, and 28 below for specific citations within this reference).

10. In response to Applicant's arguments in the last paragraph of p. 12, continuing onto p. 13, the Examiner asserts that the detailed descriptions of the rejection of claims 8-10, 22, 27, and 28, as detailed in the previous Office action, is proper under the MPEP guidelines. In each of these descriptions, the phrase "Therefore, for reasons stated above, such a claim also would have been obvious" refers to the analysis of the combined disclosure in FiD98 and statement of Official Notice relied upon in rejecting parent claim 7. In each of these descriptions, the additional disclosure cited comes from the primary reference, FiD98, and therefore, the primary reference is not further modified to incorporate the further cited features, and therefore, no additional suggestion to modify the primary reference teachings is required. In other words, the specific citations applied in the rejection of claims 8-10, 22, 27, and 28 serve to further establish the first factual inquiry of the *Graham v. Deere* test for obviousness (383 U.S. 1, 148 USPQ 459), namely determining the scope and contents of the prior art, and the remaining factual inquiries have been established in the referenced rejection of parent claim 7.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

***Claim Rejections - 35 USC § 112***

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 6, 9, 11-18, 21, 23, 25, 26, and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. As discussed above, in the amendment to the first paragraph of p. 4, Applicant significantly alters the definition of the term "input precision" by replacing the phrase "prior to" with its opposite, "after". No evidence has been presented that this amendment has been made merely to correct any obvious error. Accordingly, claims 6, 9, 11-18, 21, 23, 25, 26, and 29, which recite (or are dependent from a parent or base claim that recites) the term "input precision", contain new matter not embraced by the originally filed disclosure.

In the interest of compact prosecution, the Examiner maintains the previous interpretation of the term "input precision" as indicated by the rejections below.



***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-6, 11-21, and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Randall J. Fisher and Henry G. Dietz, "Compiling for SIMD Within a Register," 1998 Workshop on Languages and Compilers for Parallel Computing, North Carolina, Aug 1998 (hereinafter [FiD98]).

The detailed discussion of the individual rejected claims below is presented out of sequence to better reflect the dependency groupings of the claims. The order in which the claims are addressed represents the general order in which the claims would be renumbered by the Examiner upon allowance of the application.

As per claim 1, [FiD98] discloses a compiler receiving higher-level code and outputting lower-level code to enable a processor to simultaneously process multiple multi-bit data elements in a single register (see, for example, section 1 on pp. 1-4), the logic of the lower-level code including: establishing at least first and second signed, multi-bit data elements in at least a first register (see, for example, see, for example,

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section 1 on pp. 1-4; Note that the SWARC language supports signed data types--see, for example, section 4.1.1 on p. 15); and simultaneously processing the elements (see, for example, section 1 on pp. 1-4). Applicant's newly added claim limitations are specified in permissive language (for example, reciting "may"), and the broadest reasonable interpretation of these limitations is that they are optional components.

As per claim 2, [FiD98] further discloses the compiler accessing at least one of: a compiler directive, a flag, or a configuration file, to decide when to make elements independent of each other (see, for example, section 4 on pp. 14-18).

~~As per claim 19, [FiD98] further discloses the compiler generating instructions to~~  
pack multiple data elements from respective data sources into a common register to be operated on by an algorithm simultaneously with each other (see, for example, section 4 on pp. 14-18).

As per claim 20, [FiD98] further discloses the first element being a first partial element having a related second partial element established in a second register, and the lower-level code output by the compiler causing the first and second partial elements to be combined after processing (see, for example, section 2.3 on p. 9).

As per claim 3, [FiD98] further discloses a first element being provided from a first data set and a second element being provided from a second data set different from the first (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

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As per claim 4, [FiD98] further discloses the compiler allocating a respective output precision in a register for each data element to be processed in the register during a single cycle (see, for example, section 4.1.1 on p. 15).

As per claim 23, [FiD98] further discloses the compiler determining the output precision based at least in part on an input precision (see, for example, section 4.1.1 on p. 15).

As per claim 25, [FiD98] further discloses the compiler adding a bit of precision if the maximum magnitude negative number that is required for the data during processing is the maximum negative number that can be represented in the respective precision (see, for example, section 2.1.2 on pp. 6-7; and section 3.1 on p. 11).

As per claim 26, [FiD98] further discloses the compiler adding at least one bit of precision based at least in part on an operation on a data element (see, for example, section 4.1.1 on p. 15).

As per claim 24, [FiD98] further discloses the compiler receiving, as input, the output precision (see, for example, section 4.1.1 on p. 15).

As per claim 6, [FiD98] further discloses an output precision or an input precision being defined by means of a compiler directive, or a configuration file, or a variable definition (see, for example, section 4.1.1 on p. 15).

As per claim 11, [FiD98] discloses defining at least one compiler directive, instructions, or configuration file for a compiler defining at least one of: an input precision for at least one data element (see, for example, section 4.1.1 on p. 15); and

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multiple data sources of respective data elements to be packed into a common register and operated on by an algorithm simultaneously with each other (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11). Applicant's newly added claim limitations are specified in permissive language (for example, reciting "can"), and the broadest reasonable interpretation of these limitations is that they are optional components.

As per claim 12, [FiD98] further discloses the compiler determining first and second precisions to be allocated in a single register to hold respective first and second signed data elements (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11), and the compiler generating a lower-level code from a higher level code to undertake method acts comprising: packing the elements into the register (see, for example, section 4 on pp. 14-18); and operating on the elements (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

As per claim 13, [FiD98] further discloses the register sending plural data elements simultaneously to at least one computational subsystem (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

As per claim 14, [FiD98] further discloses the operation being a multiplication by a constant or by a variable of known precision, or an addition, or a shift-left logical, or a subtraction, or a bitwise AND, or a bitwise OR (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

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As per claim 15, [FiD98] further discloses the elements being independent of each other as defined by the compiler directive or configuration file (see, for example, section 1 on pp. 1-4; section 2 on pp. 4-11; and section 4 on pp. 14-18).

As per claim 16, [FiD98] further discloses the first element being provided from a first data set and the second element being provided from a second data set different than the first (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

As per claim 17, [FiD98] further discloses the first element being a first partial element having a related second partial element established in a second register, and the lower-level code causing the first and second partial elements to be combined after processing (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11).

As per claim 18, [FiD98] further discloses determining first and second precisions including determining the precisions such that the maximum negative number that can be represented in an element is one larger than the maximum negative number that can be represented in the respective precision (see, for example, section 2.1.2 on pp. 6-7; and section 3.1 on p. 11).

As per claim 21, [FiD98] further discloses the compiler directive, instructions, or configuration file embodying instructions to compile predetermined portions of code received by the compiler to be executed simultaneously on packed data (see, for example, section 1 on pp. 1-4; section 2 on pp. 4-11; and section 4 on pp. 14-18).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 5 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over [FiD98], as applied to claims 1 and 11 above in view of Andrew C. Staugaard, Jr.,

~~“Structured and Object-Oriented Techniques: an Introduction Using C++,” 1997,~~

Prentice-Hall, Inc. (hereinafter *Staugaard, Jr.*).

As per claims 5 and 29, [FiD98] in addition to the disclosure applied above, [FiD98] fails to expressly disclose the compiler receiving instructions not to compile a predetermined portion of code received by the compiler. However, *Staugaard, Jr.* teaches that comment statements have been well known and used in the art of computer programming to provide insightful documentation making source code easier to read by humans. *Staugaard, Jr.* further teaches that such comment statements are not compiled, e.g., everything following double forward slashes (“//”) in a line of C++ source code is ignored by a C++ compiler (see, for example, p.70, paragraph 3; and p. 75, whole page). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of [FiD98] to include instructions not to

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compile a predetermined portion of code. One would be motivated to do so to provide additional documentation without changing the behavior of a program.

17. Claims 7-10, 22, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over [FiD98], as applied to claims 1 and 11 above in view of U.S. Patent No. 6,080,204 to Mendel.

As per claim 7, [FiD98] discloses a compiler program for outputting lower-level code to process multi-bit, signed data elements (see, for example, see, for example, section 1 on pp. 1-4; ~~Note that the SWARC language supports signed data types--see, for example, section 4.1.1 on p. 15),~~ the lower-level code comprising: packing at least first and second data elements into a single register (see, for example, section 1 on pp. 1-4); and processing the elements simultaneously (see, for example, section 1 on pp. 1-4). [FiD98] fails to expressly disclose the use of a computer program storage device readable by a digital processing apparatus for implementing the prescribed functions. However, Mendel teaches that it has been known to use such computer program storage devices for storing computer program instructions to implement a compiler (see, for example, col. 30, line 60, through col. 34, line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of [FiD98] to include the use of such a device in order to provide a means of storing/transporting/executing instructions necessary for implementing the disclosed computer-enabled procedure. Applicant's newly added claim limitations are specified in

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permissive language (for example, reciting “permitted to”), and the broadest reasonable interpretation of these limitations is that they are optional components.

As per claim 8, [FiD98] further discloses flag means indicating whether a precision should be checked in at least one cycle (see, for example, section 4.1.1 on p. 15). Therefore, for reasons stated above, such a claim also would have been obvious.

As per claim 9, [FiD98] further discloses compiler directive means for defining an input precision (see, for example, section 4.1.1 on p. 15). Therefore, for reasons stated above, such a claim also would have been obvious.

As per claim 10, [FiD98] further discloses compiler directive means for defining multiple data sources of respective data elements to be packed into a common register and operated on by an algorithm simultaneously with each other (see, for example, section 1 on pp. 1-4; and section 2 on pp. 4-11). Therefore, for reasons stated above, such a claim also would have been obvious.

As per claim 22, [FiD98] further discloses means for indicating whether a precision should be checked (see, for example, section 4.1.1 on p. 15); means responsive to the means for indicating for checking that the packed elements do not overflow or underflow or achieve a maximum magnitude negative number representable in the precision in a cycle, undertaking wrap or saturation in the elements to prevent corruption of other data elements in a register, or signaling an error to be handled by an error-



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handling routine in the program (see, for example, section 1 on pp. 1-4). Therefore, for reasons stated above, such a claim also would have been obvious.

As per claim 27, [FiD98] further discloses means for adding a bit of precision if the maximum magnitude negative number that is required for the data during processing is the maximum magnitude negative number that can be represented in the respective precision (see, for example, section 2.1.2 on pp. 6-7; and section 3.1 on p. 11).

Therefore, for reasons stated above, such a claim also would have been obvious.

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~~As per claim 28, [FiD98] further discloses means for adding at least one bit of~~  
precision based at least partially on an operation on a data element (see, for example, section 4.1.1 on p. 15). Therefore, for reasons stated above, such a claim also would have been obvious.

### *Conclusion*

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. ~~In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.~~

19. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric B. Kiss whose telephone number is (703) 305-7737. One or around October 19, 2004, Technology Center 2100 will be relocated to Alexandria, Virginia, and Examiner Kiss's telephone number will change to (571) 272-3699. The Examiner can normally be reached on Tue. - Fri., 7:15 am - 4:45 pm. The Examiner can also be reached on alternate Mondays.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tuan Dam, can be reached on (703) 305-4552. On or around October 19, 2004, Technology Center 2100 will be relocated to Alexandria, Virginia, and Tuan Dam's phone number will change to (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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~~EBK/EBK~~

August 26, 2004



ANTONY NGUYEN-BA  
PRIMARY EXAMINER